

AMENDMENTS TO THE CLAIMS

Without prejudice, please amend the claims as reflected in the following listing of claims, which will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently amended) An apparatus for conducting fluid in a fuel cell, the apparatus comprising

a unitary gas-impermeable body having:

a face having a recessed surface and a wall extending around said recessed surface, said recessed surface and said wall defining a fluid dispersion area;

a plurality of spaced apart protrusions protruding from said recessed surface in said fluid dispersion area such that portions of said recessed surface extend all around each of said protrusions, each protrusion having a protrusion surface spaced apart from said recessed surface, wherein said plurality of spaced apart protrusions are arranged in rows and columns, and wherein alternate columns of protrusions are staggered relative to adjacent columns;

an inlet opening, a first plurality of inlet conduits, and a distribution area between said inlet opening and said first plurality of conduits for distributing fluid to said first plurality of conduits for communication to said fluid dispersion area; and

an outlet opening and an outlet conduit, said outlet conduit being in

communication with said fluid dispersion area and said outlet opening to facilitate communication of fluid between said fluid dispersion area and said outlet opening.

2. (Original) The apparatus of claim 1 wherein said recessed surface is generally planar.
3. (Original) The apparatus of claim 2 wherein said recessed surface has a generally rectangular shape.
4. (Original) The apparatus of claim 2 wherein said recessed surface has a generally trapezium shape.
5. (Original) The apparatus of claim 2 wherein said recessed surface has a length and a width, said width decreasing from a first width adjacent said inlet opening to a second width adjacent said outlet opening.
6. (Original) The apparatus of claim 1 wherein said body includes a plate.
7. (Cancelled)
8. (Previously presented) The apparatus of claim 1 wherein said recessed surface has a length and a width, said width decreasing from a first width adjacent said inlet opening to a second width adjacent said outlet opening.
9. (Previously presented) The apparatus of claim 1 wherein said outlet conduit comprises a second plurality of conduits and wherein said body further comprises a receiving area between said second plurality of conduits and said outlet opening for receiving fluid from said second plurality of conduits for exhaust through said outlet opening.

10. (Original) The apparatus of claim 1 wherein said body is formed from a castable electrically-conductive corrosion-resistant material.
11. (Original) The apparatus of claim 1 wherein said body is formed from graphite material.
12. (Original) The apparatus of claim 1 wherein said body is formed from a metal, said metal being coated with at least one of graphite powder, titanium, and gold.
13. (Original) The apparatus of claim 1 wherein said body is formed from a composite material.
14. (Original) The apparatus of claim 1 wherein said body is formed from a composite material, said composite material being coated with at least one of graphite powder, titanium, and gold.
15. (Original) The apparatus of claim 1 wherein each said protrusion surface has a generally curved shape.
16. (Original) The apparatus of claim 1 wherein each said protrusion surface has at least one of a rectangular, circular and triangular shape.
17. (Original) The apparatus of claim 1 wherein each said protrusion surface lies in a common plane.
18. (Original) The apparatus of claim 1 wherein said recessed surface has a total recessed surface area and wherein each said protrusion surface has a respective surface area and wherein a sum of said respective

surface areas is approximately equal to said total recessed surface area.

19. (Cancelled)
20. (Cancelled)
21. (Original) The apparatus of claim 1 wherein each said protrusion is spaced apart from adjacent protrusions by a common distance.
22. (Original) The apparatus of claim 1 wherein said protrusion surface is disposed approximately 0.5 mm to 0.8 mm from said recessed surface.
23. (Previously Presented) The apparatus of claim 1 wherein said body has a groove extending around said recessed surface, for receiving a seal for sealing said face to an adjacent component in the fuel cell.
24. (Previously Presented) The apparatus of claim 23 further comprising a first bridge member and wherein said face has a first support surface adjacent said inlet conduit for supporting said first bridge member over said inlet conduit.
25. (Previously Presented) The apparatus of claim 24 further comprising a second bridge member and wherein said face has a second support surface adjacent said outlet conduit for supporting said second bridge member over said outlet conduit.
26. (Previously Presented) The apparatus of claim 24 wherein said groove further comprises groove portions adjacent said first support surface, said seal including an inner portion operable to lie in said groove portions and wherein said first bridge member is operable to support said inner portion.

- 27.** (Original) The apparatus of claim 1 wherein said body includes a plate, said face being on said plate and being generally flat.
- 28.** (Previously Presented) The apparatus of claim 27 wherein said plate includes cooling means for cooling said plate, on a side of said plate opposite said face.
- 29.** (Previously Presented) The apparatus of claim 28 wherein said cooling means includes parallel spaced apart grooves formed in said plate.
- 30.** (Previously Presented) The apparatus of claim 28 wherein said protrusions are formed in an array, said array defining an active area of said plate and wherein said cooling means is disposed opposite said active area.
- 31.** (Previously Presented) The apparatus of claim 29 wherein said body has an inwardly facing side and an outwardly facing side, said recessed surface being formed in said inwardly facing side, said inwardly facing side being operable to contact a gas diffusion layer of a membrane of said fuel cell and said grooves being formed in said outwardly facing side to facilitate cooling.
- 32.** (Previously Presented) The apparatus of claim 28 wherein said body has an inwardly facing side and an outwardly facing side, said recessed surface being formed in said inwardly facing side, said inwardly facing side being operable to contact a gas diffusion layer of a membrane assembly of said fuel cell and wherein said cooling means is formed in said outwardly facing side and comprises:

a second recessed surface and a second wall extending around said second recessed surface, said second recessed

surface and said second wall defining a second fluid dispersion area;

a second plurality of spaced apart protrusions protruding from said second recessed surface in said second fluid dispersion area such that portions of said second recessed surface extend all around each of said protrusions, each protrusion having a protrusion surface spaced apart from said second recessed surface; and

a second inlet opening operable to receive cooling fluid, a second inlet conduit, a second outlet opening and a second outlet conduit, said second inlet conduit being in communication with said second inlet opening and said second fluid dispersion area to facilitate communication of cooling fluid from said second inlet opening to said second fluid dispersion area and said second outlet conduit being in communication with said second fluid dispersion area and said second outlet opening to facilitate communication of said cooling fluid between said second fluid dispersion area and said second outlet opening.

33. (Original) The apparatus of claim 27 further comprising openings extending through said plate, adjacent said recessed surface, for receiving mounting devices therethrough, for mounting said plate in the fuel cell.
34. (Previously Presented) The apparatus of claim 1 further comprising an electrical conduit mount for mounting a first electrical conduit to said body such that said first electrical conduit extends generally perpendicular to said face of said body.
35. (Previously Presented) The apparatus of claim 34 further comprising a first electrical conduit connected to said electrical conduit

mount, said first electrical conduit having a first circuit termination portion.

36. (Previously Presented) The apparatus of claim **35** further comprising an insulator on said first electrical conduit.

37. (Original) The apparatus of claim **1** further comprising mounting openings in said body for mounting said body to the fuel cell.

38. (Previously Presented) The apparatus of claim **1** further comprising a conduit opening in said body for receiving a conduit operable to conduct electrical power from said fuel cell.

39. (Currently amended) A fuel cell stack apparatus comprising:

a first fuel cell membrane assembly having a proton exchange membrane and anode and cathode gas diffusion layers on opposite sides of said proton exchange membrane;

a first fluid supply apparatus comprising a gas impermeable body having a first inwardly facing side and a first outwardly facing side, said first inwardly facing side being in contact with said anode gas diffusion layer and having:

a first recessed surface and a first wall extending around said first recessed surface, said first recessed surface and said first wall defining a first fluid dispersion area;

a first plurality of spaced apart protrusions protruding from said recessed surface in said first fluid dispersion area such that portions of said recessed surface extend all around each of said protrusions, each protrusion having a

protrusion surface spaced apart from said recessed surface, said protrusion surfaces being operable to contact said anode gas diffusion layer, wherein said plurality of spaced apart protrusions are arranged in rows and columns, and wherein alternate columns of protrusions are staggered relative to adjacent columns;

a first inlet opening for receiving anode reactant fluid, first plurality of inlet conduits, and a first distribution area between said first inlet opening and said first plurality of inlet conduits for distributing anode reactant fluid to said first plurality of inlet conduits for communication of said anode reactant fluid to said first fluid dispersion area,

a first outlet opening and first outlet conduit, said first outlet conduit being in communication with said first fluid dispersion area and said first outlet opening to facilitate communication of anode reactant fluid between said first fluid dispersion area and said first outlet opening; and

a second fluid supply apparatus comprising a unitary gas-impermeable body having:

a second inwardly facing side and a second outwardly facing side, said second inwardly facing side being in contact with said cathode gas diffusion layer and having a second recessed surface and a second wall extending around said second recessed surface, said second recessed surface and said second wall defining a second fluid dispersion area;

a second plurality of spaced apart protrusions protruding from said second recessed surface such that portions of said second recessed surface extend all around each of said protrusions, each protrusion having a protrusion surface spaced apart from said second recessed surface, wherein said plurality of spaced apart protrusions are arranged in rows and columns, and wherein alternate columns of protrusions are staggered relative to adjacent columns;

a second inlet opening operable to receive cathode reactant fluid, second plurality of inlet conduits, and a second distribution area between said second inlet opening and said second plurality of inlet conduits for distributing cathode reactant fluid to said second plurality of inlet conduits for communication of said cathode reactant fluid to said second fluid dispersion area; and

a second outlet opening and second outlet conduit, said second outlet conduit being in communication with said second fluid dispersion area and said second outlet opening to facilitate communication of excess cathode reactant fluid and water from said cathode gas diffusion layer from said second fluid dispersion area to said second outlet opening.

40. (Previously Presented) The apparatus of claim 39 wherein said second outwardly facing side of said second fluid supply apparatus comprises cooling means for cooling said second fluid supply apparatus.
41. (Previously Presented) The apparatus of claim 40 wherein said cooling means comprises:

a third face on said second fluid supply apparatus, said third face having a third recessed surface and a third wall extending around said third recessed surface, said third recessed surface and said third wall defining a third fluid dispersion area;

a third plurality of spaced apart protrusions protruding from said third recessed surface in said third fluid dispersion area such that portions of said third recessed surface extend all around each of said protrusions, each protrusion having a protrusion surface spaced apart from said recessed surface; and

a third inlet opening for receiving cooling fluid, a third inlet conduit, a third outlet opening for draining cooling fluid and a third outlet conduit, said third inlet conduit being in communication with said third inlet opening and said fluid dispersion area to facilitate communication of cooling fluid from said third inlet opening to said third fluid dispersion area and said third outlet conduit being in communication with said third fluid dispersion area and said third outlet opening to facilitate communication of cooling fluid between said third fluid dispersion area and said third outlet opening.

- 42.** (Previously Presented) The apparatus of claim **40** wherein said cooling means comprises a plurality of parallel grooves in said outwardly facing side of said second fluid supply apparatus said grooves being operable to conduct cooling fluid to facilitate cooling of said second fluid supply apparatus.

43. (Previously Presented) The apparatus of claim **39** further comprising:

first and second current collector plates in contact with said first and second fluid supply apparatuses respectively, each of said first and second current collector plates having an inwardly facing side and an outwardly facing side;

first and second electrical conduits respectively secured to at least one of said inwardly and outwardly facing sides of said first and second current collector plates respectively;

first and second insulators on said first and second conduits respectively;

said first and second conduits being secured to said first and second current collector plates such that said first and second conduits extend through openings in components of the fuel cell and are insulated from said components by said first and second insulators, such that said first and second conduits extend from a same end of said fuel cell.

44. (Cancelled)

45. (Cancelled)

46. (Cancelled)

47. (Cancelled)

48. (Cancelled)

49. (Cancelled)

50. (Cancelled)

51. (Cancelled)